LETTERS TO THE EDITOR

CIRCUIT CONVENTIONS

Dear Sir—I. L. Stefani says (Dec. 1970 *E & P*, p. 447) that he was not aware that he had dealt with the origin of the mesh notation for currents. He did so at the top of column 3 on p. 293 in the August 1970 *E & P*. I called his attention to it by substituting what seemed to me, having had something to do with the matter, a more correct account. Yet he insists on calling it 'Bow's notation'. This, I consider, is misleading. Bow did not invent a notation for electric currents. (There is some doubt even whether he originated the notation for structures.) The mesh notation for currents is not derived logically from Bow's notation: it is basically different in principle, although the superficial analogy is interesting enough to mention. Where a double-subscript voltage notation based on nodes is used, the mesh notation for currents is the counterpart, derived directly and logically by applying the principle of duality.

Mr. Stefani showed the mesh notation among those which he said appeared to qualify for inclusion in his 'master set', and, even in his December 1970 letter, concedes that it has merits. Yet in the same letter he also says: 'I surmised that a lot of people, like myself, tentatively played with the idea and rejected it'. What caused this remarkable reappraisal? If the idea had been gone into sufficiently by even one among the 'lot of people' for its logical derivation and its merits to be appreciated, it is hardly believable that there would not be some evidence, if not in published work, at least in unpublished notes. I would be greatly obliged to Mr. Stefani if he would refer me to the earliest such evidence, so that I could give credit where it is due by naming the notation after the person responsible.

In reply to my inquiry about the 'restrictions' of the mesh notation, Mr. Stefani says that he could counter by asking about the restrictions of the classical arrows. It is, however, unnecessary for him to ask me about them, as I have set them forth in considerable detail in 'Phasor diagrams'.* When the case for one of two alternatives becomes sufficiently strong, it almost ceases to be a matter of personal preference.

As to the two points he adduces against the mesh notation, the first is easily answered: a loop enclosing several meshes is identified by the letters of the meshes enclosed. I have not found a need for this, and would welcome actual examples. With regard to the second point, there is a difficulty with 3-dimensional circuits; but again I have not felt this need and would like to see examples. I confess that my study of practical notations and conventions has been limited mainly to electrical-engineering textbooks and other literature, from which Mr. Stefani's circuits, 'too complex to reproduce on paper', are excluded by definition.

I would repeat that the notations and conventions that I advocate are suitable even for circuits that are much more complicated than those usually attempted. I would be interested to see the other conventions applied to circuits that are too complicated to put on paper. Another point I would repeat is that the conventions set out in Appendix 2 of 'Phasor diagrams' are the minimum needed for all the information normally required, but if anyone wishes to add arrows or other devices for emphasis, or for some other special purpose, I would not seek to stop them. But 'maximum

*SCROGGIE, M. G.: 'Phasor diagrams' (Iliffe, 1966)

freedom', advocated by Mr. Stefani, and commonly practised, has led to the present state of confusion. Some agreed common language is needed to end it.

I believe such common language should be based on a combination of logic and practical advantage, and not necessarily on what Mr. Stefani happened to do in his youth, as in his choice of capital letters for nodes. He again goes back to the past ('the dawn of electrical engineering') in seeking to justify + and — signs as potential-difference conventions in a.c. circuits, but he does not attempt a more valid answer to the criticisms of this practice in my letter (Oct. 1970 *E & P*, p. 384) and elsewhere, or even to his own admission of its limitations. His own dictum might be echoed here: 'To fail one test is to fail'. Merely expressing surprise that what used to be done in the distant past is not accepted as necessarily the best now is not enough.

Nor does he respond to my invitation to show in which respects the conventions that I favour fail to qualify for 'universal application' more signally than do his conventions. I look forward to the fuller exposition in his article.† As I appreciate the limitations of space in your columns, perhaps Mr. Stefani would be good enough to tell me privately about the 'many other' restrictions on the use of the mesh notation for currents.—Yours faithfully,

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18 Bromley Common, Bromley, Kent BR2 9PD
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